

ABSTRACT OF THE DISCLOSURE

[0039] An apparatus for monitoring conditions in subterranean borehole during drilling and pullback operations in real time. The apparatus includes a drill string having a working end. A measurement system suitable for measuring at least one operational characteristic of the apparatus and having a metallic section in direct contact with the drill string is operably connected to the working end of the drill string. At least one toroid is circumferentially disposed around a first portion of the metallic section and has toroidal electrically conductive windings. A non-conductive material is disposed around the toroid whereby contact between the toroid and a subterranean environment during operation of the apparatus is precluded.